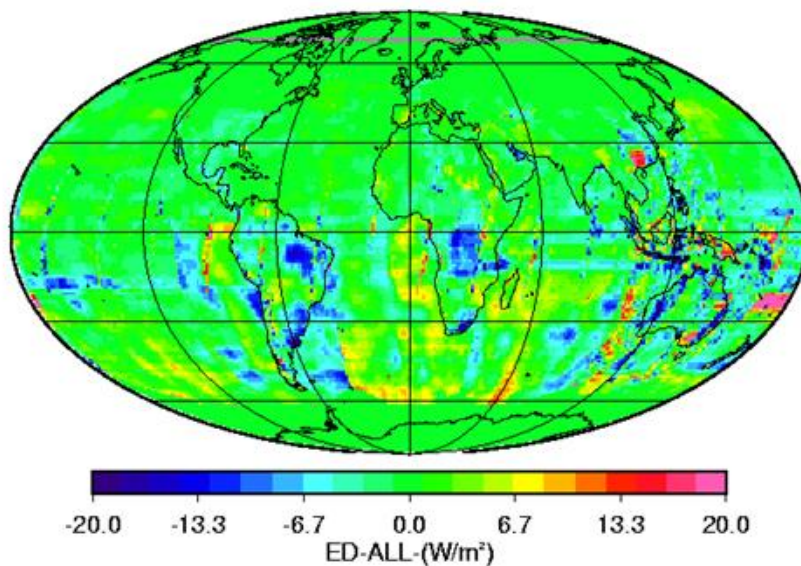


SW Regional Normalization Terra SRBAVG Ed2D processing error while CERES instrument was in RAPS mode

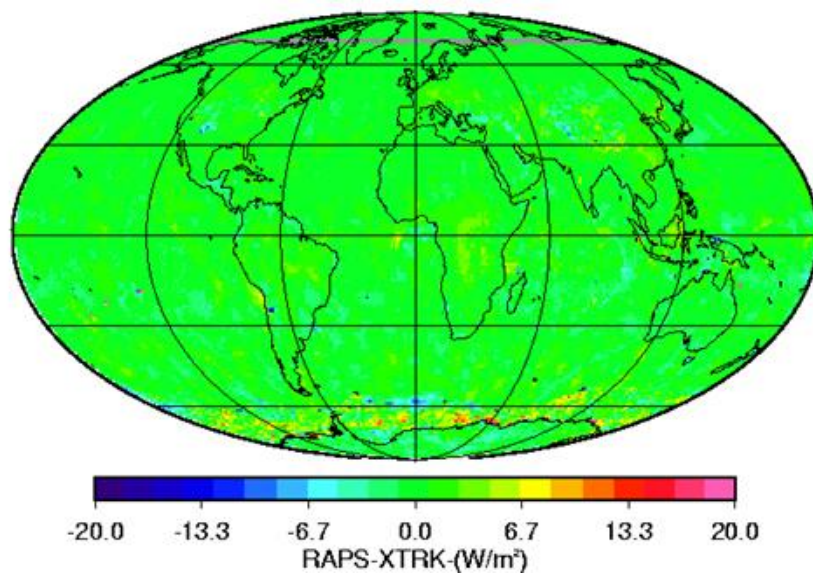
The SW regional normalization algorithm removes any biases or trends in the GEO narrowband to broadband flux conversion with respect to the CERES flux measurements. This ensures that the SRBAVG GEO SW flux product maintains the calibration of the CERES instrument. The algorithm computes a gain and offset correction, which are applied to all instantaneous GEO derived SW fluxes for a given region over the course of a month. The gain and offset are computed using a regression of all regionally gridded matched CERES observed and GEO broadband fluxes within 1.5 hours using all regions within 5° longitude by 5° latitude centered on the given region. The surrounding regions must have the same geo-type to be utilized for the regression. The algorithm must have a minimum number of matches for the regression otherwise a 5° zonal band of regions is used for the regression.

In the case of CERES RAPS mode the viewing and azimuth angle are undefined since the RAPS scan mode does not provide uniform spatial sampling. There was a check for valid angles in the SW regional normalization algorithm, which should have not been implemented. However there are usually one or two days of XTRK scans mode while the instrument is designated in RAPS mode for the month. The algorithm there for computed gains and offsets from very sparse zonal regressions. This has introduced regional and global biases when compared with the gains and offsets using all RAPS and XTRK matches (1st Figure). The normalization error is also evident when comparing XTRK - RAPS mode differences. The 2nd Figure shows little regional difference between XTRK and RAPS mode SRBAVG GEO product fluxes, while third Figure shows large regional differences. The Ed2D - corrected global SW flux bias for January and July 2002 were -0.50 Wm^{-2} (-0.5%) and -0.44 Wm^{-2} (-0.5%) respectively. The corresponding 60°N to 60°S regional rms was 4.21 and 3.95 Wm^{-2} respectively. The -0.5% global SW flux bias is more than likely to persist throughout the entire Terra SRBAVG Edition2D RAPS dataset.

January 2002 FM2(RAPS), Ed2D (error) - corrected SW flux



January 2002 FM2(RAPS) corrected - FM1(XTRK) SW flux



January 2002 FM2(RAPS) Ed2D (error) - FM1(XTRK) SW flux

